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10/529,184	03/24/2005	Takahiro Horiguchi	268669US26PCT	4352
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER MACARTHUR, SYLVIA	
			ART UNIT 1763	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/529,184	Applicant(s) HORIGUCHI ET AL.	
	Examiner Sylvia R. MacArthur	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 23 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/23/2006, 6/6/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1 and 7-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 11-18 of copending Application No. 10/529,191 in view of Aoyama et al (US 5,651,827).

This is a provisional obviousness-type double patenting rejection.

Regarding claim 1: The co-pending application, namely claim 16 claims a substrate processing apparatus comprising: a processing vessel that defines a processing space, a UV source, a heater portion, and a holding member.

The co-pending application fails to claim an opaque case the covers the inner wall of the processing vessel and the co-pending application also fails to claim a rotational drive means for

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rotating an axis of the holding member that penetrates through the heater portion. The citation of “rotational drive means for ...” invokes 112,6th (means-plus function). The examiner interprets the “rotational drive means” according to the disposed specification section [116] where rotational drive unit is recited. The motor 12 of Aoyama as illustrated in Fig. 12 rotates the holder 11. Note Figures 5, 6, 8, 10, 12, 14, and 16 also illustrate a rotating holder. The motivation to use the teaching of Aoyama et al to rotate the holder is that rotation enhances the treatment of the wafer and ensures greater uniformity. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the co-pending application to incorporate the rotation of the holding member.

Regarding the opaque case covering the inner wall of the processing vessel. Aoyama et al teaches the use of opaque quartz on the inner walls in order to maintain uniform heating and heat insulation over a long time of operation, see col. 3 lines 57-64. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the co-pending application to incorporate rotating the holding member and using inner walls of opaque quartz as taught by Aoyama et al.

Regarding claims 7-10: The co-pending application fails to teach a UV protective glass blocking window.

Aoyama et al teaches UV glass blocking windows that are part of the opaque liner, see Figs. 7 (element 20), Fig. 8 (element 18), Fig. 11 (1b), Fig. 12 (opaque portions), Figs. 14 and 16 (element 18). The first and second windows are the transparent and opaque portions illustrated in each Figure listed above, see also col. 3 lines 38-65. The motivation to modify the co-pending application to incorporate the UV glass blocking window of Aoyama et al is to control the

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amount of radiant energy passing into the processing vessel from the UV source. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the co-pending application to include the UV glass blocking windows of Aoyama for better process control.

Regarding claims 11 and 12: The co-pending application fails to teach transparent quartz arm portions. The susceptor and pins (arm portions) of Aoyama are made of transparent quartz according to col. 8 lines 50-64 to provide uniform heating the substrate backside and ensure that the time needed for the substrate to reach the desired temperature is shortened. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the co-pending application to provide the transparent quartz arm portions of Aoyama to shorten heating time and thus increase overall processing throughput.

3. Claims 1-6, 11, and 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 11-18 of copending Application No. 10/529,191 in view of McDiarmid et al (US 6,301,434).

Regarding claim 1: The co-pending application, namely claim 16 claims a substrate processing apparatus comprising: a processing vessel that defines a processing space, a UV source, a heater portion, and a holding member.

The co-pending application fails to claim an opaque case the covers the inner wall of the processing vessel and the co-pending application also fails to claim a rotational drive means for rotating an axis of the holding member that penetrates through the heater portion.

The prior art of McDiarmid et al teaches an opaque quartz liner see abstract. The motivation to use an opaque liner as McDiarmid et al discussed in the abstract is that it reduces

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contaminants and undesired deposits and simplifies cleaning because opaque quartz is a better reflector according to col. 5 lines 38-43. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide an opaque quartz liner to cover the inner walls of the processing vessel of the co-pending application.

Regarding the rotational drive means: The citation of “rotational drive means for ...” invokes 112,6th (means-plus function). The examiner interprets the “rotational drive means” according to the disposed specification section [116] where rotational drive unit is recited. The substrate support 118 sits on a rotation ring 130 and is rotated by a rotation drive mechanism, see col.5 lines 17-37. The motivation to use the teaching of McDiarmid et al to rotate the holder is that rotation enhances the treatment of the wafer and ensures greater uniformity. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the co-pending application to incorporate the rotation of the holding member.

Regarding claim 2: The co-pending application fails to claim a lifter member that raises and lowers the substrate. Col. 4 lines 54-67 of McDiarmid et al teaches that the holding members is lifted by an elevational mechanism (lifter member). The motivation to incorporate the teachings of McDiarmid et al to use a lifter member is that the distance of the substrate relative to the heater portion can be controlled. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use the lifter member of McDiarmid et al in the apparatus of the co-pending application. See Fig. 1A regarding the openings.

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Regarding claim 3: The co-pending application fails to claim that the opaque case (liner) includes a cylindrical case that cover an outer periphery of the heater portion.

The liner 164 of McDiarmid et al are cylindrical shaped and cover the periphery of the heater portion 150. Col. 6 lines 53-65 teaches that the use of opaque quartz allows for easy cleaning. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide opaque case of McDiarmid et al in the co-pending application to protect the heater from contaminants that would interfere with its ability to provide ample temperature control.

Regarding claim 4: See claim 11 of the co-pending application wherein such a transparent case is recited.

Regarding claim 5: See claim 12 of the co-pending application wherein the depressurizing part is provide to depressurize both the internal space of the transparent case and the internal space of the chamber at the same time.

Regarding claim 6: The claims of the co-pending application do not recite that the heater plate is constructed of SiC.

McDiarmid et al teaches a ring/plate heater 150 made of SiC. The motivation to construct the plate of SiC is that it is a known suitable non-contaminating material of construction as recited in col. 6 lines 53-67. Thus it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to construct the heater plate of the co-pending application of SiC.

Regarding claims 11 and 12: The co-pending application fails to teach transparent quartz arm portions. McDiarmid et al teaches lift pins 116 (arm portions) are made of quartz. The

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motivation to construct the pins of transparent quartz is that the material is known to reduce the absorption of radiation and thermal mass according to col. 5 lines 38-51. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide transparent arm portions in the co-pending application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyama et al (US 5,651,827) in view of Okase et al (US 6,399,922).

Regarding claim 1: Aoyama et al teaches a processing vessel (chambers as illustrated in Figs.3, 5, 6, 9, 10,12, and 14-16, an opaque case (liner) see abstract, a heater portion 30a, a holding member (susceptor 7), and a rotational drive means. Regarding the rotational drive means: The citation of “rotational drive means for ...” invokes 112,6th (means-plus function). The examiner interprets the “rotational drive means” according to the disposed specification section [116] where rotational drive unit is recited. The motor 12 of Aoyama as illustrated in Fig. 12 rotates the holder 11. Note Figures 5, 6, 8, 10,12, 14, and 16 also illustrate a rotating holder.

Aoyama et al fails to teach a UV light source.

Okase ('922) teaches the use of a UV light source a heat treating apparatus. The motivation to provide UV light source 90 of Okase in the apparatus of Aoyama is that it is a suitable means of irradiation. Thus, it would have been obvious for one of ordinary skill in the

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art at the time of the claimed invention to provide the UV light source of Okase ('922) in the processing vessel of Aoyama et al.

Regarding claims 7-10: The co-pending application fails to teach a UV protective glass blocking window.

Aoyama et al teaches UV glass blocking windows that are part of the opaque liner, see Figs. 7 (element 20), Fig. 8 (element 18), Fig. 11 (1b), Fig. 12 (opaque portions), Figs. 14 and 16 (element 18). The first and second windows are the transparent and opaque portions illustrated in each Figure listed above, see also col. 3 lines 38-65.

Regarding claims 11 and 12: The susceptor and pins (arm portions) of Aoyama are made of transparent quartz according to col. 8 lines 50-64.

6. Claims 1-6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDiarmid et al (US 6,301,434) in view of Okase et al (US 6,399,922).

Regarding claim 1: McDiarmid et al teaches a processing vessel (chamber 100) an opaque case (liner 164) see col. 7 lines 15-33, a heater portion 150, a holding member (118), and a rotational drive means. Regarding the rotational drive means: The citation of "rotational drive means for ..." invokes 112,6th (means-plus function). The examiner interprets the "rotational drive means" according to the disposed specification section [116] where rotational drive unit is recited. The substrate support 118 sits on a rotation ring 130 and is rotated by a rotation drive mechanism, see col.5 lines 17-37.

McDiarmid et al fails to teach a UV light source.

Okase ('922) teaches the use of a UV light source a heat treating apparatus. The motivation to provide UV light source 90 of Okase in the apparatus of Aoyama is that it is a

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suitable means of irradiation. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the UV light source of Okase ('922) in the processing vessel of Aoyama et al.

Regarding claim 2: Col. 4 lines 54-67 of McDiarmid et al teaches that the holding members is lifted by an elevational mechanism (lifter member). See Fig. 1A regarding the openings.

Regarding claim 3: The liner 164 of McDiarmid et al are cylindrical shaped and cover the periphery of the heater portion 150.

Regarding claims 4, 11, and 12: McDiarmid et al teaches lift pins 116 (arm portions) are made of quartz in col. 4 line 2 and the ring heater 150 is made of clear quartz in col. 6 lines 53-61.

Regarding claim 5: It is anticipated that the internal space of the transparent case and the internal space of the chamber at the same time as both are exhausted via the same exhaust system as recited in col. 4 lines 7-21.

Regarding claim 6: McDiarmid et al teaches a ring/plate heater 150 made of SiC.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art of Blersch et al (US 5,965,047) teaches RTP system wherein substrate rotates relative to a chamber. Fig. 6 illustrates a quartz upper plate 52 and a lower plate 54, the edges of the upper and lower plates are made of opaque quartz.

The prior art of Samoilov et al (US 6,455,814) teaches an opaque liner using in a chamber having a susceptor within a transparent quartz structure.


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The prior art of Halpin (US 2002/0185062) teaches a sidewall made of opaque quartz, a SiC susceptor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Sylvia R MacArthur
Primary Examiner
Art Unit 1763

May 14, 2007